

**Primary care physicians' use of the 5 A's to counsel adolescents about alcohol use**

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## Table of Contents

<b>Abstract .....</b>	<b>3</b>
<b>Systematic review: screening and brief intervention for adolescent alcohol use in primary care .....</b>	<b>5</b>
Abstract.....	5
Introduction .....	6
Methods .....	7
Results .....	9
Discussion.....	17
Tables and Figures .....	19
References.....	23
<b>Primary care physicians' use of the 5 A's to counsel adolescents about alcohol use ..</b>	<b>25</b>
Abstract.....	25
Introduction .....	25
Methods .....	26
Results .....	28
Discussion.....	29
Acknowledgements.....	32
Tables and Figures .....	33
References.....	37

## ABSTRACT

*Background:* Despite reductions in underage drinking in the United States since the 1980s, adolescent alcohol use remains a significant burden to public health. Multiple clinical guidelines recommend screening, brief intervention, and referral to treatment (SBIRT) for adult alcohol misuse in primary care, but there is no consensus about this practice with adolescents. Furthermore, it is unknown to what degree physicians use the 5 A's model in addressing adolescent alcohol use.

*Objectives:* To review the literature regarding the efficacy of screening and brief intervention for adolescent alcohol use in primary care settings and to use secondary data to describe physicians' use of the 5 A's (Ask, Advise, Assess, Assist, Arrange) for adolescent alcohol use in primary care.

*Methods:* For the systematic review, I searched the MEDLINE and CINAHL databases through February 2015 for experimental or observational studies examining both screening and brief intervention with average-risk 11-18 year-olds in primary care clinics. I abstracted data and assessed the quality of each study. This literature review informed the secondary data analysis, in which we audio recorded 540 adolescent well and chronic care visits with 49 primary care physicians. We identified visits in which alcohol was discussed, and conversations were analyzed for use of the 5 A's.

*Results:* Four articles were included in the systematic review, two rated "fair" in overall quality, and two "poor." Only one intervention reduced adolescent alcohol use; two found increases in drinking behavior and one found no effect. In the audio-recorded visits, physicians and patients discussed alcohol in 61% of visits. In 64% of these, physicians used one or more of the 5 A's. In none of the visits were all 5 A's used. Physicians were most likely to Ask and Advise about alcohol use. Few Assessed, Assisted, and Arranged. Asking drinkers clear, non-leading questions was associated with increased likelihood of reporting alcohol use to physicians.

*Conclusions:* Evidence about the use of SBIRT for adolescent alcohol use in primary care is unclear and of poor to fair quality. Few physicians addressed all of the 5 A's when counseling adolescents about alcohol use. Effective methods are needed to increase the quality of physician screening and counseling for underage drinking. Further examination of such interventions and systematic review of their use in other clinical settings or among higher-risk populations may be warranted in order to determine how to best use clinical time and resources to reduce alcohol-related morbidity and mortality among adolescents.

## **Systematic review: screening and brief intervention for adolescent alcohol use in primary care**

### **ABSTRACT**

*Background:* Despite reductions in underage drinking in the United States since the 1980s, adolescent alcohol use remains a significant burden to public health. Multiple clinical guidelines recommend screening, brief intervention, and referral to treatment (SBIRT) for adult alcohol misuse in primary care, but there is no consensus about this practice with adolescents.

*Objectives:* To determine the efficacy of screening and brief intervention for adolescent alcohol use in primary care settings.

*Methods:* I searched the MEDLINE and CINAHL databases through February 2015. My inclusion criteria required that experimental or observational studies examined both screening and brief intervention with average-risk 11-18 year-olds in primary care clinics, and reported an outcome related to alcohol use, morbidity, or mortality. I abstracted data and assessed the quality of each study. Data collected included the study population and setting, a description of the intervention, primary outcome(s) assessed, and significant results. Quality was graded based on risk of selection bias, measurement bias, and confounding.

*Results:* Of the 467 articles identified by the search, four were included in the review. Two of the articles were of “fair” overall quality, and two were “poor.” Only one intervention reduced adolescent alcohol use; two found increases in drinking behavior and one found no effect.

*Conclusions:* Evidence about the use of SBIRT for adolescent alcohol use in primary care is unclear and of poor to fair quality. Further examination of such interventions and systematic review of their use in other clinical settings or among higher-risk populations may be warranted in order to determine how to best use clinical time and resources to reduce alcohol-related morbidity and mortality among adolescents.

## INTRODUCTION

Many people begin experimenting with alcohol use in adolescence. Although there have been substantial reductions in underage drinking frequency and intensity in the United States since the passage of national minimum drinking age laws in the 1980s<sup>1,2</sup>, adolescent drinking remains a pervasive public health problem. In the 2013 Youth Risk Behavior Surveillance (YRBS) conducted by the Centers for Disease Control and Prevention, 66% of high school students endorsed having at least one drink in their life.<sup>2</sup> Early onset of alcohol use is associated with significant morbidity and mortality, including motor vehicle accidents, risky sexual behavior, violent behavior, other substance use, and substance use disorders.<sup>3-6</sup> In addition to the public health burden of adolescent alcohol use, recent estimates of the annual cost of underage drinking in the United States range from \$27 to \$62 billion.<sup>7,8</sup>

The United States Preventive Services Task Force (USPSTF) recommends screening all adults 18 and older for alcohol misuse and providing brief behavioral counseling to those engaged in risky or hazardous use.<sup>9</sup> However, in the systematic review for this guideline, the authors found no studies enrolling adolescents that met their inclusion criteria<sup>10</sup>, and the USPSTF concluded that there is insufficient evidence to recommend the practice of Screening, Brief intervention, and Referral to Treatment (SBIRT) for adolescents in primary care.<sup>9</sup> Nonetheless, organizations including the American Academy of Pediatrics and the National Institute on Alcohol Abuse and Alcoholism continue to advocate for annual SBIRT with adolescents.<sup>11,12</sup> Multiple studies have documented the difficulty of providing all recommended preventive services in primary care.<sup>13,14</sup> As such, it is worthwhile to examine the state of the evidence for SBIRT with adolescents in primary care so that primary care providers can make a well-informed decision about when to provide such services.

Despite the USPSTF's review finding no randomized controlled trials of at least six months duration to meet inclusion criteria<sup>10</sup>, experimental and observational studies have been conducted to determine the effectiveness of SBIRT for alcohol with adolescents in primary care.

Several recent reviews attempt to summarize such evidence.<sup>15-19</sup> The two most recent articles are narrative in nature, describing search strategies but not inclusion/exclusion criteria, data extraction, or critical appraisal of the evidence.<sup>18,19</sup> The others describe comprehensive search strategies, inclusion/exclusion criteria, and data extraction<sup>15-17</sup>; however, only one attempts to critique the quality of the evidence, and this is not done systematically.<sup>15</sup> Moreover, new research in this area has emerged since the publication of that highest-quality systematic review.<sup>20,21</sup> The goal of this current systematic review is to identify and review the literature that specifically addresses the efficacy of SBIRT for adolescent alcohol use in primary care.

## METHODS

This systematic review was undertaken to answer the following key question: “What is the efficacy of screening and brief intervention for adolescent alcohol use in primary care in terms of reduction in alcohol use and alcohol-related morbidity and mortality?” This question was modeled after Key Question 1 in the recent review for the USPSTF, without the requirement for long-term (six month or more) outcomes; it focuses on the direct evidence for screening and brief intervention together, rather than as separate practices.<sup>22</sup> Although the ideal outcome of interest is alcohol-related morbidity and mortality, my prior knowledge of the evidence suggested that such a review might be too limited in scope, so I included alcohol use as a primary outcome.

### *Search strategy*

With the assistance of Mellanye Lackey, a medical librarian, I designed MEDLINE and CINAHL search strategies to identify relevant articles (**Table 1**), and performed a search on February 20, 2015. I also conducted hand searches of the references of articles that underwent full text review.

### *Inclusion/exclusion criteria*

Inclusion criteria were experimental or observational studies conducted in primary care clinics, among average-risk 11-18 year-olds or including results of 11-18 year olds stratified by

age, where all experimental participants received both screening and brief intervention and all control participants received neither, reporting a follow-up outcome related to alcohol use, morbidity, or mortality. I excluded studies that occurred exclusively in University/College health centers, military clinics, detention centers, hospitals, or emergency departments; those that targeted high-risk drinkers and/or specific patient populations (i.e., pregnant teens); and studies focusing on screening or brief intervention independent of each other.

#### *Title review*

I conducted a review of all titles to identify articles for inclusion. When in doubt, I erred on the side of inclusion, to capture all possible relevant articles. Because of my prior awareness of a possible study for inclusion conducted in Brazil, I did not limit the country or language of the study. I excluded articles whose title indicated that the study topic was only tangentially (or not at all) related to adolescent alcohol use. I also excluded articles whose question or design was outside of the scope of the inclusion criteria described above, eliminating titles whose study designs were about screening or intervention separately, cross-sectional in nature, in non-primary care settings, and among high-risk patient populations. Titles that were focused on changing physician behavior with regards to SBIRT were included in case they examined adolescent behaviors as secondary outcomes. Titles that focused on adults were included in case the age range included some in the target age range of 11-18. Articles that appeared likely to be systematic or narrative reviews, clinical recommendations, or guidelines were included in order to avoid eliminating useful articles.

#### *Abstract review*

After the title review, I reviewed the remaining abstracts for relevance to my key question. As above, I excluded articles at the abstract level not meeting inclusion criteria. Again, I erred on the side of inclusion. All included titles and those whose abstracts were not available underwent a full text review.

#### *Full text review and hand search*



Articles that met inclusion criteria under the title and abstract review, or those without abstracts, were read in their entirety to determine eligibility for inclusion. As above, I used pre-specified inclusion and exclusion criteria to determine which articles to include in my final systematic review. When articles were in another language, I used Google Translate to translate the methods to determine whether or not inclusion was appropriate; in two cases, a Russian-speaking medical colleague assisted in this endeavor. At this stage, systematic reviews were excluded based on different key questions. I reviewed the reference lists of all full text articles, including systematic and narrative reviews, clinical recommendations, and guidelines, to identify other pertinent studies, and then performed a second abstract and full text review of these articles.

#### *Abstraction and appraisal of evidence*

I used a critical appraisal tool with which I was previously familiar to evaluate the potential for selection bias, measurement bias, and confounding, as well as the overall quality, of each study. Each article received a grade of 1, 2, or 3 to reflect risks (1=low risk, 3= high risk) for selection bias, measurement bias, and confounding; these scores were summed to grade the overall quality of the article as good (scores of 3 or 4), fair (scores of 5, 6, or 7) or poor (scores of 8 or 9). I used a Microsoft Excel spreadsheet to record this information, as well as data about the study setting, population, design, intervention, comparison, outcomes measured, and results.

## RESULTS

### *Search findings*

A flow diagram of my search and identification of articles is presented in **Figure 1**. The MEDLINE and CINAHL searches as described above yielded 425 unique article titles. These results were filtered to exclude titles pertaining to unrelated topics; inappropriate study questions or designs; patient characteristics not meeting inclusion criteria; studies examining screening, diagnosis, or treatment of adolescent alcohol use/abuse; and reviews of guidelines.

The abstracts of the remaining 104 articles were further reviewed using the same inclusion and exclusion criteria. I reviewed the full text and references of 57 articles, ultimately identifying four studies that met inclusion criteria for the systematic review. The citations and descriptions of the study populations and settings, interventions, control groups, outcomes measured, significant results, and overall quality rating are included in **Table 2**.

### *Analysis*

The first article by Stevens et al.<sup>23</sup> was a cluster randomized control trial with 4096 5<sup>th</sup> and 6<sup>th</sup> graders and their parents at 12 primary care sites in New England. The baseline rate of the children ever consuming alcohol was 8%. Investigators compared children who received a multi-component intervention targeting alcohol and tobacco risk behaviors to those who received a similar intervention targeting bicycle helmet use, seatbelt use, and gun safety. The intervention included an in-office risk assessment, discussion of the given risk behaviors during visit, and contract with patient/parent/physician to discuss the issue further at home. Parents received a letter 10 days later from physician, then 36 months of follow-up with quarterly newsletters, bi-annual phone calls, and reinforcement at subsequent office visits.

At 12 months, there were no significant differences in reports of ever drinking alcohol between alcohol/tobacco intervention and safety intervention recipients (adjusted OR 1.17, 95% CI 0.92, 1.48). At 24 and 36 months, alcohol intervention recipients were *more* likely to report ever drinking alcohol (aOR at 24 months 1.27, 95% CI 1.03, 1.55; aOR at 36 months 1.30, 95% CI 1.07, 1.57).

This large study with relatively long duration of follow-up had several methodological strengths, including low potential for measurement bias due to use of previously validated measures, equal application of measures to both groups, and extensive process measures to ensure exposure to interventions. Its cluster randomized design minimized potential contamination between groups, although the intensity of the intervention and the potential for overlap of topics in parental conversations with youth introduces the possibility that patients in

the safety group may have talked about alcohol use with parents, biasing the results towards the null.

This study had moderate to high potential for both selection bias and confounding. Although randomization seems to have been successful in that the two groups seem relatively well matched at baseline (except for the percent female in each group), the investigators did not report variables that could have been associated with the outcome, including patient ethnicity, gender of parent receiving intervention, and age of parent receiving intervention. Patient gender was adjusted for in calculating odds ratios. Most concerning, the numbers included in the tables do not correspond to any of the numbers of patients reported in the text as initially enrolled or having follow-up data on, and it is not clear from the article or supporting figures how dropouts were distributed between the two study groups or how missing data were included or excluded from analysis.

Overall, this was a fair study, and its findings that a multi-component intervention increases adolescent alcohol use at 24 and 36 months should be interpreted cautiously. Furthermore, multiple characteristics of the study population and setting, including a baseline rate of parental drinking problems of approximately 40%, being conducted in small towns and cities in New England, and unknown racial/ethnic backgrounds of study participants may limit the external validity of the study's findings.

The second study by Boekeloo et al.<sup>24</sup> was a randomized control trial of 409 12-17 year-olds in five primary care practices in the Washington, D.C. metropolitan area. At baseline, 16% of the enrolled children were current drinkers. Participants were randomized to one of three study arms: usual care, audio intervention alone with six-month booster, or audio intervention plus physician priming with the adolescent's self-assessment sheet with six-month audio booster. Adolescent reports of hanging around friends while they drank, refusal to drink when asked by others, drinking in the last 30 days, drinking in the last three months, and bingeing in the last three months were assessed at six and twelve months.

At six months, participants who received the audio intervention only (Group 2) were more likely than control participants (Group 1) to report bingeing in the last 3 months (odds ratio 3.44, 95% CI 1.07-11.01); participants who received the audio intervention and the provider prompt (Group 3) were more likely than control (Group 1) to refuse to drink when asked by others (OR 2.08, 95% CI 1.29-3.35) and to report bingeing in the last three months (OR 4.71, 95% CI 1.55-14.30). At 12 months, those in Group 2 were more likely than Group 1 to drink in the last 30 days (OR 2.31, 95% CI 1.31-4.07), drink in the last three months (OR 1.76, 95% CI 1.12-2.77), and binge in the last 3 months (OR 3.00, 95% CI 1.44-6.24); those in Group 3 were more likely than Group 1 to binge in the last three months (OR 2.86, 95% 1.13-7.26). All other differences between six- and 12-month outcomes were nonsignificant.

The major strengths of this study were its attempt to measure two relatively feasible in-office interventions, to measure fidelity of the intervention through adolescent exit surveys, and to measure the effect of the intervention through a randomized design. However, there were several major methodological and reporting weaknesses that threaten the validity of any conclusions from this article.

First, participants were assigned to one of three study groups using computer randomization, stratified by provider, adolescent sex, and adolescent age. The authors do not report the actual baseline characteristics of the 444 patients who received the intervention, but rather those of the 409 who completed the one-year follow up. Thus, it is impossible to determine the extent to which randomization was successful. They did report differential dropout rates in each group and a higher rate of baseline drinkers dropping out of the control group, which could bias any observed effect of the interventions towards the null. In the groups that were actually analyzed, baseline rates of drinking and the percent African American were different across groups. All of these facts taken together suggest a moderate to high potential for selection bias. Similarly, because there were obvious differences between the groups, but the authors reported only unadjusted odds ratios, there is a high potential for confounding.

Second, the study had a moderate potential for measurement bias. It was not explicit as to whether the researchers conducting follow-up telephone calls were blinded to participants' randomization status, or that the measures used to assess alcohol use were previously validated. However, the authors cite the CDC's Youth Risk Behavior Surveillance, with which I am familiar as a validated tool in non-clinical settings. The greatest measurement weakness, which the authors posit in their discussion, is that the audio intervention's injunction to truthfully discuss alcohol use with providers may have changed reporting behavior at follow up. In other words, the measures the researchers selected may have been sensitive to the intervention and not adequately captured true changes in adolescents' behavior during the study.

Overall, the quality of this study was fair, and its conclusions that an audio intervention with or without additional provider prompting may increase adolescent alcohol use should be interpreted with a fair degree of skepticism. The wide confidence intervals also detract from the certainty of the results. Moreover, since 79% of the study's population was African-American, it is worthwhile to be cautious while extrapolating any study results to populations with different demographic distributions.

The third article, by Ozer et al.<sup>20</sup>, was a single group quasi-experimental study with an ecological comparison. The authors compared the multiple behaviors, including drinking, 904 adolescents (measurements taken at age 14 and age 15 from the same patients) in three pediatric clinics in Northern California with the behaviors of 711 14-year-olds and 699 15 year-olds on the 2001 California Health Interview Survey. The clinic participants filled a health questionnaire before their visit, with relevant health behavior information transcribed onto charting form that providers received. They received a 4 A's-based intervention for any risky behaviors, and advice to maintain current behaviors if they had no risky behaviors. In addition, all clinic patients met with a health educator after the visit to focus on goal setting and self-efficacy. The main outcome measured was the difference in patients reporting ever using

alcohol at ages 14 and 15. The rate of drinking increased by 10.6% in both groups, so the authors determined that the intervention had no effect (odds ratio 1.0, 95% CI 0.78-1.3).

Although this study might be lauded for its creative use of an existing data set and its theoretical grounding in a model that has been useful for addressing substance use in primary care, it contains many methodological flaws that raise concern for high potential of bias in the results. The study's major strength is that the two groups had similar baseline rates of ever trying alcohol. In terms of selection bias, the comparison groups are different by design: the control outcome is a cross-sectional one where rates of drinking in one group of fourteen-year-olds are compared to those in another group of fifteen-year-olds. In contrast, the intervention outcome is a longitudinal one, comparing rates of drinking in fourteen-year-olds to themselves one year later. Each sample group was recruited differently, there are baseline differences in race/ethnicity between the two groups, and the authors do not report whether demographic differences existed in the CHIS sample groups between ages 14 and 15. Moreover, they do not describe how the 17% of intervention participants who dropped out of the study differed from those who have follow-up data, although the fact that CHIS participants had no opportunity to drop out renders differential dropout a non-issue.

There was a high potential for measurement bias in this study. First, it is not clear that the intervention participants were asked the same questions as their CHIS counterparts regarding alcohol use, or that the question asked in the intervention had been validated. Second, although 94% of physicians adhered to the intervention in the pre-implementation period, the paper included no reports of intervention fidelity during the actual implementation period. Third, while CHIS participants were surveyed over the telephone, all 14-year-old intervention recipients were surveyed in person, with 85% of 15-year-old follow-ups in person and 15% via mail. The individuals conducting or coding the follow-up surveys were necessarily not blinded to intervention condition.

In terms of confounding, there was also a high potential for bias. The authors did stratify by gender and found no differences. However, from the article's Table 1, it is clear that the two groups differed in terms of racial/ethnic breakdown, but no attempt was made to adjust for these. Moreover, they did not report any other demographics that might be associated with alcohol use, including income or a marker of socioeconomic status, or grade in school at the beginning of the study.

Overall, because of the differences in selection and measurement of the two groups and the lack of any attempt to adjust for these, the quality of this study is poor and its results should not be interpreted to indicate anything about the relative utility of this particular clinical intervention.

The fourth and final article, by Harris et al.<sup>21</sup>, was a quasi-experimental asynchronous study conducted with 12-18 year-olds in New England (n=2096) and the Czech Republic (n=589). For the first 18 months of recruitment, subjects received treatment as usual. For the second 18 months of recruitment, subjects received a computerized intervention that included a CRAFFT screen for alcohol and drug use, individualized risk reporting and education. Providers received a report of the screening results, patients' risk levels, and 6 to 10 talking points. At both baseline and three months, patients were asked about past 90-day alcohol use, and at both baseline and 12 months, patients were asked about any past 12-month alcohol use. For three-month follow-up, participants in the intervention group were less likely to have consumed alcohol in the last ninety days than those in the control group (adjusted relative risk ratio 0.54, 95% CI 0.38-0.77). At 12-month follow-up, participants in the intervention group were less likely than control to have consumed alcohol in the last 12 months (aRRR 0.66, 95% CI 0.57-0.92). In analyses stratified by baseline alcohol use, the intervention was only associated with increased cessation among baseline drinkers at three months (aRRR 1.49, 95% CI 1.17-1.91), with no significant difference among those with no drinking at baseline; at twelve months, the intervention was only associated with decreased initiation among those with no drinking at

baseline (aRRR 0.66, 95% CI 0.47-0.93), with no significant difference among those with baseline drinking. No significant differences were observed at either time point for participants in the Czech Republic.

The largest weakness of this study was in selection. Because participants were not selected randomly, there were large differences in New England between groups at baseline with respect to age, gender, race, parent education level, parent/sibling/peer substance use, type of visit, type of provider, and gender of provider. In addition, baseline past-90-day and past-12-month alcohol use rates were higher in the control group in New England. Dropouts and late follow up were also quite in New England (25-30%), but attrition was similar in both the rate and profile of participants with lost or late follow up. Given all of this, the potential for selection bias was moderate to high.

The measurement techniques employed in this study were generally adequate, with use of validated methods for measuring substance use and confounders and patient report to determine intervention fidelity. Both study arms had equal rates of phone and in-person follow-up. However, by nature of the study design, research staff were necessarily unblinded to the experimental condition of the participant being interviewed, and this necessarily introduces a moderate degree of measurement bias.

This study's major strengths were primarily in its statistical analyses. Although there were baseline differences between groups (discussed below), the authors adequately adjusted for these in calculating relative risk ratios. Also, they further stratified the results by baseline substance use and country, they used generalized estimated equations to account for clinical site in their analysis, and they compared this analysis to a mixed effects analysis to account for within-subject changes. The results from the mixed effects and GEE models were similar. The researchers assessed baseline exposure to alcohol or drug information in the past twelve months to account for historical confounding in this asynchronous design and found no between group differences in either country. Thus, the overall potential for confounding was low. In



addition to analyzing only data for which they had follow-up surveys, they also performed a separate analysis imputing missing data and compared it to the nonimputed; again, the results were similar. The consistency of results with multiple analyses strengthens the authors' findings.

Overall, the quality of this study was fair, and its conclusions that computer-based screening and provider brief advice reduced adolescent alcohol use at three and twelve months in the United States should be interpreted carefully. Because the results were not consistent in the Czech Republic, there are obvious geographic limitations to the external validity of the findings that should be considered before any attempts to generalize.

## DISCUSSION

In this systematic review, I sought to determine the evidence for screening and brief intervention for adolescent alcohol use in primary care. Based on the USPSTF's recent review<sup>9</sup>, I expected to find studies that, although maybe not of sufficient duration or quality to include in a systematic review for the USPSTF, might still be relevant in shaping providers' behavior when it comes to addressing alcohol use. However, the overall strength of studies evaluating combined screening and brief intervention for alcohol use among average-risk adolescents is fair. Two studies found that the intervention increased some drinking, one found no effect, and one found that the intervention decreased drinking. These facts, combined with the wide range of interventions and outcomes measured, further limit any ability to generalize the studies' results.

### *Limitations*

This review is subject to several limitations. First, only one reviewer identified articles for inclusion and exclusion and extracted data, introducing potential for selection and measurement bias. Furthermore, due to time constraints, I did not review conference abstracts or grey literature. My search strategy was necessarily specific, and my findings may be limited by the inclusion and exclusion criteria I established in terms of patient risk factors and age, clinical setting, and whether or not all screened participants received an intervention.

### *Conclusions and implications for future research*

Given the methodological quality of the studies I identified, it is currently impossible to determine whether SBIRT is effective for reducing morbidity and mortality due to adolescent alcohol use. Researchers committed to answering this question could continue to pursue it. The study by Harris et al. was of the highest quality, requires minimal physician time, and had the most promising results in favor of SBIRT; researchers could adapt this intervention to a randomized control trial (RCT) or cluster RCT design, with trial sites outside of New England and additional outcomes assessing morbidity and mortality.

Furthermore, prior to additional research, it may be prudent to systematically review the evidence for screening and brief intervention in a step-wise manner, analogous to the multiple key questions in an analytic framework used to design systematic reviews for the USPSTF. For example, a future systematic review might examine separately the evidence of the efficacy of screening for adolescent alcohol use in primary care and the evidence for brief interventions for alcohol use in primary care. Evaluating the existing evidence and designing higher quality studies of SBIRT could be instrumental in shaping how primary care providers allocate time and resources to the prevention of alcohol-related morbidity and mortality.

TABLE 1: Systematic review search strategy

Database	Search Strategy
MEDLINE	(primary health care[MeSH] OR pediatrics[MeSH] OR ambulatory care[MeSH]) AND (adolescent[MeSH]) AND ("Alcohol-Related Disorders"[MeSH] OR "Alcohol Drinking"[MeSH] OR "Alcoholism"[MeSH] OR "drinking behavior"[MeSH Terms])
CINAHL	((MH "Drinking Behavior+") OR (MH "Alcohol-Related Disorders+") OR (MH "Alcohol Drinking+") OR (MH "Alcohol Drinking+")) AND (MH "Adolescence+") AND ((MH "Outpatient Service") OR (MH "Ambulatory Care Facilities+") OR (MH "Primary Health Care+") OR (MH "Pediatrics"))

FIGURE 1. Flow diagram of study selection

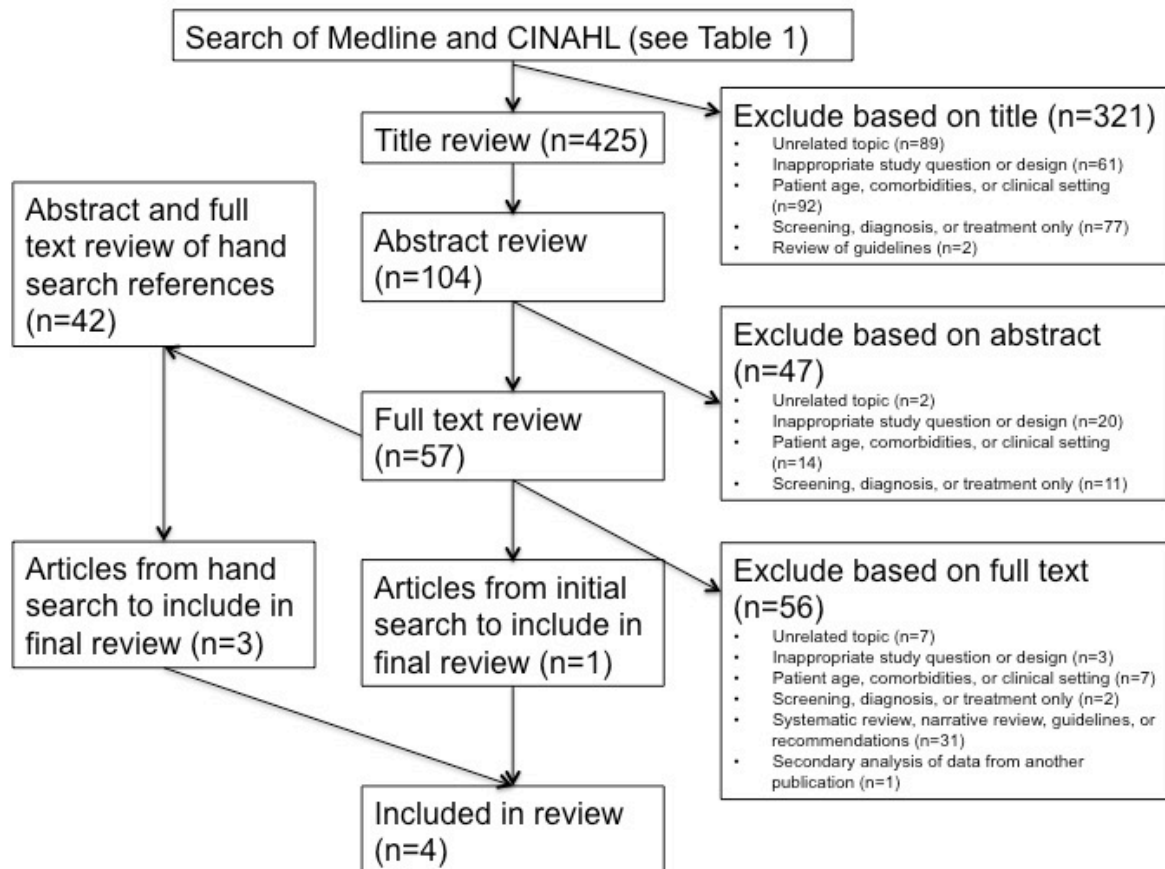


TABLE 2:

Citation	Design	Study Population and setting	Intervention	Comparison Group	Alcohol-Related Outcomes Measured	Significant results	Overall Quality
Stevens et al., 2002	Cluster randomized control trial	3145 5 <sup>th</sup> and 6 <sup>th</sup> grade children at health supervision visits in 12 pediatric practices in New England.	Risk assessment, discussion of <b>alcohol + tobacco risks</b> during visit, contract regular mail and phone follow-up	Risk assessment, discussion of <b>bicycle helmet use and safe gun storage</b> during visit, regular mail and phone follow-up	Reports of ever drinking alcohol at 12, 24, 36 months	At 24 and 36 months, intervention recipients more likely to report ever drinking alcohol.	Fair
Boekeloo et al, 2004	Randomized control trial	409 12-17 year-olds seeing 25 PCPs at 5 practices in Washington, D.C for general check-ups.	Group 2: 15 min audio intervention, 6 month 15-min booster; Group 3: 15 min audio intervention + provider prompting intervention, 6 month 15-min booster	Group 1: Usual Care with 15-minutes of listening to radio	Reports of hanging around friends while they drank, refusal to drink when asked by others, drinking in last 30 days, drinking in last 3 months, and bingeing in last 3 months, all at 6 and 12 month time points	At 6 months, Group 2 more likely than Group 1 to report binge drinking in last 3 months; Group 3 more likely than Group 1 to report refusal to drink, and bingeing. At 12 months, Group 2 more likely than Group 1 to report drinking in last 30 days, drinking in last 3 months, and binge drinking; Group 3 more likely than Group 1 to report	Poor

Ozer et al., 2011	Single group quasi-experimental intervention with ecological comparison groups	904 14 year-olds being seen for well visits at 3 pediatric clinics in Northern California.	Health questionnaire transcribed onto charting form. 4 A's-based intervention for risky behavior. All patients met with health educator after visit for 15-30 minute.	Cross-sectional data from 2001 California Health Interview Survey 14 and 15 year olds	Change in percent ever using alcohol from age 14 to age 15	No difference	Poor
Harris et al., 2012	Quasi-experimental, asynchronous	12-18 year-olds in New England (2096) and Prague (589) arriving for routine care or well visits (9 clinics in New England, 10 in Prague).	Treatment as usual (first eighteen months of recruitment).	Computerized screening and intervention (second eighteen months of recruitment) with provider receiving report and talking points	Past three month alcohol use at three month follow-up; past 12 month use at 12-month follow-up	At both three and 12 months in New England, intervention recipients were less likely to have consumed alcohol.	Fair

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## **Primary care physicians' use of the 5 A's to counsel adolescents about alcohol use**

### **ABSTRACT**

*Background:* Underage drinking contributes to significant morbidity, mortality, and financial cost to society in the United States. Multiple clinical guidelines recommend screening and brief intervention for adolescent alcohol use in primary care, but it is unknown to what degree physicians use the 5 A's model when addressing adolescent alcohol use.

*Objectives:* To describe physicians' use of the 5 A's (Ask, Advise, Assess, Assist, Arrange) for adolescent alcohol use.

*Methods:* We audio recorded 540 adolescent well and chronic care visits with 49 primary care physicians. We identified visits in which alcohol was discussed, and conversations were analyzed for use of the 5 A's.

*Results:* Physicians and patients discussed alcohol in 61% of visits. In 64% of these, physicians used one or more of the 5 A's. No physician used all 5 A's. Physicians were most likely to Ask and Advise about alcohol use. Few Assessed, Assisted, and Arranged. Asking drinkers clear, non-leading questions was associated with increased likelihood of reporting alcohol use to physicians.

*Conclusions:* Few physicians addressed all of the 5 A's when counseling adolescents about alcohol use. Effective methods are needed to increase the quality of physician screening and counseling for underage drinking.

### **INTRODUCTION**

Approximately 35% of US high school students drink alcohol.<sup>1</sup> More than 20% endorse high risk alcohol-related behaviors, including riding in a car with someone who has been drinking alcohol, driving a car after drinking alcohol, drinking more than five drinks on one occasion, and engaging in sexual intercourse while under the influence of alcohol or drugs.<sup>1</sup> Adolescent alcohol use and experimentation is also associated with injury, violence, criminal behavior, unemployment, other substance use, and development of substance use disorders.<sup>2-5</sup>

As such, the consequences of underage drinking cost the United States \$27 to \$62 billion annually.<sup>6,7</sup> Efforts to reduce adolescent alcohol use could meaningfully reduce adolescent morbidity and mortality and its costs to society.

Both the American Academy of Pediatrics (AAP) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) advocate for annual Screening, Brief Intervention, and Referral to Treatment (SBIRT) for adolescent alcohol use.<sup>8,9</sup> The 5 A's framework (Ask, Advise, Assess, Assist, Arrange), initially developed for tobacco cessation<sup>10</sup>, is consistent with the NIAAA's recommendations for SBIRT for adolescent alcohol use.<sup>8</sup> This framework has been adapted for and used successfully with tobacco cessation among children and adolescents.<sup>11,12</sup> It is also a useful construct for conducting and evaluating behavioral counseling for multiple behaviors, including alcohol, in clinical settings.<sup>13-16</sup> To our knowledge, no prior studies have used the 5 A's framework to evaluate primary care physicians' discussions of alcohol use with adolescents. In this retrospective cohort study, we capitalize on a dataset of audio-recorded encounters between primary care physicians and overweight and obese adolescents. The aim of this study was to determine the degree to which physicians employ the 5 A's in counseling adolescent patients about alcohol use.

## METHODS

This study is a secondary analysis of the Teen CHAT study, a randomized trial that attempted to improve physician counseling about weight with overweight and obese teens.<sup>17</sup> All adolescents provided written assent, and physicians and parents of the adolescents provided written consent. This project was approved by Duke's Institutional Review Board and was given exempt status by the University of North Carolina – Chapel Hill Institutional Review Board. Data collection began in November 2009 and ended in February 2014.

### *Study sample and procedures*

Forty-nine primary care pediatricians and family physicians were recruited from three academic and eight community-based practices in the Triangle Region of North Carolina. Each

physician had one to 15 (mean 11) encounters with adolescent patients recorded during the three phases of the trial, with a total of 540 visits recorded. Patients who had upcoming well visit or chronic care appointments with study physicians were recruited and screened by telephone. Eligible patients were aged 12 to 18 years, English speaking, non-pregnant, cognitively competent, and had an age-gender specific body mass index (BMI)  $\geq 85\%$ .

When patients presented for their appointment, staff confirmed study eligibility and obtained written assent/consent. An audio recorder was placed in an unobtrusive location in the exam room for the duration of the patient visit.

### *Measures*

Physician demographics were collected by written questionnaire at study enrollment. Study staff administered baseline questionnaires to patients by telephone and three-month follow-up questionnaires in person that included questions about demographics, smoking, and drug and alcohol use. We assessed substance use with questions from the Centers for Disease Control and Prevention (CDC) Middle School Youth Risk Behavior Surveillance Survey.<sup>18</sup> For the current analysis, 1-2 researchers reviewed all recordings for alcohol-related content. We double-coded 20% to assess inter-rater reliability.

We developed a codebook to identify physician use of the 5 A's in each conversation. The patient or physician could initiate each topic and be coded as using the respective A: 1) *Asks* about patient or peer alcohol use, 2) *Advises* on topics of alcohol, 3) *Assesses* willingness to maintain abstinence or change drinking behavior, 4) *Assists* in setting goals and 5) *Arranges* for follow-up via physician visit or referral to outside care, which was coded only when patients endorsed drinking alcohol in the presence of the physician (Table 1). We coded separately any 5 A's-based conversations related to driving after drinking or riding in a car with a driver who had been drinking and excluded them from this analysis.

We also determined who initiated alcohol-related conversations and coded drinking status as disclosed to the physician as "non-drinker," "drinker" or "unclear." "Non-drinkers" were

asked about their own use and/or peer use and denied alcohol use; “drinkers” were asked about their own use and endorsed alcohol use. We coded adolescents as “unclear” if the physician did not ask about alcohol use or patients endorsed peer use and the physician did not ask specifically about patient use. One coder analyzed audio recordings, with 10% double-coded to assess reliability. The two coders discussed all disagreements, and final decisions were made by consensus. Inter-rater agreement was substantial (Cohen’s kappa=.76).<sup>19</sup> All coders were blinded to baseline and follow-up questionnaire data.

### *Analysis*

All analyses were performed using SAS version 9.2 (SAS Institute, Inc., Cary, NC). We used descriptive statistics to describe the sample of patients, to compare adolescent reports of drinking on surveys with their reports in encounters with physicians, and physician use of the 5 A’s.

## RESULTS

### *Sample characteristics*

Of the 49 physicians who agreed to participate in the study, 40 were pediatricians, and 9 were family physicians. Most physicians were female (65%) and white (82%). Mean age was 40.9 years (Table 2). Of the 540 adolescents, 57% were female, 37% were white, and 51% were African American. Mean age was 14.6 years, and three-quarters had mothers with a post-high school education. Most patients (72%) were not first time or new patients (Table 2).

### *Conversations about alcohol*

Many of the 540 conversations recorded included alcohol-related discussions (n=327, 61%); physicians initiated almost all 325 (99%) of the conversations. Of these, 54 contained conversations about drinking and driving. In 312 encounters, physicians asked about patient or peer alcohol use; patients’ reports during encounters with physicians agreed with their survey responses in 255 (82%) encounters. Of the 117 patients who endorsed drinking on the baseline

survey, only 73 (62%) discussed alcohol with their physician. Thirty-four of those who endorsed drinking on the baseline survey (29%) told their physician they were drinking.

#### *Physician use of 5 A's*

In 209 of the 327 encounters where alcohol was discussed (64%), physicians used at least one of the 5 A's. Of visits in which an "A" was used, few physicians used more than one (Table 3). Physicians Asked about peer and/or patient alcohol use in a clear and non-leading manner in 30% of the visits. An additional 30% of patients were asked unclear and/or leading questions. Of adolescents who endorsed drinking alcohol on the baseline survey, patients who were asked clear, non-leading questions had higher rates of reporting alcohol use to their physicians (58%) than those who were asked unclear or leading questions (21%) (Table 4).

In 6 visits (1%), physicians gave adolescents clear, strong, personalized Advice about alcohol use. In an additional 242 visits (45%), physicians advised patients about alcohol use, but the advice was not clear, not strong, and/or not personalized. Physicians Assessed adolescents' willingness to change drinking behavior or maintain abstinence in a non-leading manner in 8% of visits. Physicians Assisted adolescents to change or maintain behavior in 9% of visits. No physicians Arranged a future visit.

#### DISCUSSION

Physicians and their adolescent patients discussed alcohol in over half of our audio-recorded well and chronic care visits. Physicians used at least one of the 5 A's in most of these encounters, with physicians most frequently Asking and Advising. Physicians' screening questions were often unclear and leading, and drinkers who were asked clear and non-leading questions were more likely to report alcohol use to physicians than those who were asked unclear or leading questions.

Physicians discussed alcohol use with adolescents in 61% of visits. This is significantly lower than the rate of 79% reported in the only known study of audio recordings of adolescent well visits, but the participants in that study were, on average, 1.4 years older than in the

present one.<sup>20</sup> Our results are consistent with recent studies of adolescent report of alcohol discussion<sup>21</sup> and electronic medical record documentation of screening.<sup>22</sup> Guideline-making organizations disagree in their recommendations for screening and brief intervention for adolescent alcohol use<sup>9,23</sup>, and providing all of the recommended clinical preventive services in primary care is time-consuming.<sup>24</sup> Thus, while it is laudable that alcohol was discussed in the majority of adolescent encounters, it is not surprising that nearly 40% of encounters did not contain alcohol-related conversations. Nonetheless, it is particularly concerning that physicians did not discuss alcohol with 71% of adolescents who reported drinking on the baseline survey

When physicians discussed alcohol with adolescents, they used at least one of the 5 A's in most of the conversations, primarily Ask and Advise. The emphasis on Ask and Advise is consistent with previous research on 5 A's counseling.<sup>25-28</sup> Such behavior also follows from how physicians are trained to address health behaviors, as exemplified by the AAP's Bright Futures Guidelines' focus on risk reduction through screening and anticipatory guidance.<sup>9</sup> In contrast, the NIAAA's Practitioner's Guide for Alcohol Screening and Brief Intervention recommends behaviors that correspond to Assess, Assist, and Arrange for non-drinkers and drinkers.<sup>8</sup> Recent studies have documented a relationship between Assist and Arrange and smoking cessation, with no association between Ask, Advise, or Assess and cessation.<sup>28,29</sup> Park et al. posit that physicians who use only Ask, Advise, and Assess may reinforce stigma and evoke feelings of discomfort, whereas those who also Assist and Arrange may be perceived as more helpful.<sup>28</sup> Assist and Arrange may be particularly useful for adolescents participating in risky alcohol use, and failing to authentically engage them through collaborative process may represent a missed opportunity to promote self-efficacy to refuse alcohol in the future and reduce risky alcohol use.

Finally, although many physicians Asked about adolescent alcohol use, approximately half of them asked in unclear or leading manners. Both the NIAAA and AAP guidelines recommend specific questions that are clear and non-leading.<sup>8,9</sup> Patients who reported ever

drinking on the baseline survey were much more likely to report alcohol use to their physician when they were asked a clear, non-leading questions than those who were asked questions that were unclear or leading. When patients are asked leading questions that presume alcohol abstinence, they may feel uncomfortable disclosing alcohol use. In terms of clarity, physicians may group multiple substances into one question in order to save time, but patients may be confused by such questions or answer only about one substance.

Because physicians in this study were not taught how to discuss alcohol and were not told the study was about how they address alcohol, our results are valid estimates of how physicians discuss alcohol use with adolescents in usual care. Nonetheless, this analysis does have limitations. First, all of the patients in the study were overweight and obese adolescents. Because rates of alcohol-related discussion in this study are similar to those recently reported by teens of all weights<sup>21,30,31</sup>, it is unlikely that physicians decided whether to initiate conversations about alcohol based on patients' BMI. However, physicians may have prioritized talking about weight-related behaviors over alcohol use with this patient population, so this analysis may underestimate use of the 5 A's in well visits with non-overweight teens. Second, the physicians were participating in a randomized control trial in which those randomized to the experimental arm received training in using the 5 A's to discuss weight. Thus, although we did not observe any change in rates of use of the 5 A's to discuss alcohol between baseline and post-intervention phases in either arm of the study, the use of 5 A's for adolescent alcohol use in actual practice may actually be lower than those detected in this study. Third, we did not assess physicians' use of written screening questionnaires. Such tools could be interpreted as clear and non-leading ways to Ask, and they could explain why so many physicians asked about alcohol use in a leading manner or grouped multiple substances into one question.

This is the first study to characterize use of the 5 A's in addressing adolescent alcohol use. Physicians discuss alcohol with the majority of adolescents, but fail to engage a significant number of self-reported drinkers in such conversations. When physicians do discuss alcohol,

they use at least one of the 5 A's 64% of the time, and they are most likely to Ask about peer or patient alcohol use. Asking clear and non-leading screening questions increases the reliability of adolescents' reports of alcohol use to physicians. Physicians may benefit from research and guidelines clarifying when and with which patients to discuss alcohol use. Medical education efforts should target teaching physicians to utilize all parts of the 5 A's model in addressing adolescent alcohol use and improving the clarity and quality of physicians' screening questions.

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TABLE 1: 5 A's: Definitions and Examples

	Definition	Example
Ask	Physician asks about the patient or peers' alcohol use in a clear, non-leading manner.	"Do kids at school drink alcohol?" "How much do you drink?"
Advise	Physician provides the patient with clear, strong, personalized advice.	Clear "Your decision not to drink alcohol is very mature." "You need to drink less." Strong "As your doctor, I recommend that you not drink alcohol." "It is really important that you try to stop drinking." Personalized "Drinking could affect your ability to do well in school, and you want to go to college." "You need to stop drinking because you got sick from alcohol last weekend."
Assess	Physician assesses patient's readiness to maintain abstinence or quit drinking alcohol in a non-leading manner.	"What are your plans for drinking in the future?" "How important is it for you to try and drink less?"
Assist	Physician provides brief counseling or self-help materials to help patient maintain abstinence or quit.	"What will you do about alcohol when you go to college next year?" "Here is a list of websites that talk about alcohol use and teens."
Arrange	Physician schedules follow-up visits or phone calls to review progress toward abstaining from alcohol.	"You come back in a year, but I would like to see you sooner to see how your these changes are going. Why don't we schedule a follow-up visit to see how you're doing with these goals?"

Table 2: Participant characteristics

Variable	Value
Adolescents (n=540)	
Age, mean (SD), y	14.6 (2.0)
Female, %	57
Race, % (missing=3)	
White	37
African-American	51
Asian-American	1
Multi-racial	8
Other	2
Not reported	1
Mother's education, % (missing = 32)	
High school or less	23
Trade/some college	19
4-year degree	34
Advanced degree	20
Unknown	3
First visit with this physician,% (missing =25)	28
Ever had a drink of alcohol, %	22
Of drinkers, age at first drink, %	
<13 years old	9
≥13 years old	91
Ever smoked cigarettes, %	13
Ever smoked marijuana, % (missing =1)	15
Physicians (n=49)	
Age, mean (SD), y (missing = 5)	40.9 (8.5)
Female, %	65
Race, %	
White	84
African-American	10
Asian-American	6
Pediatrician, %	82
Years since medical school, mean (SD), y	11.8 (8.7)

Table 3. Number of 5 A's used by physicians to talk about alcohol in well visits with adolescents, stratified by baseline drinking status.

Number of 5 A's Used	Non-drinkers, Frequency (%) (n=423)	Drinkers, Frequency (%) (n=117)
0	272 (64)	59 (50)
1	116 (27)	48 (41)
2	30 (7)	7 (6)
3	5 (1)	3 (3)

Table 4. Of patients who endorsed drinking on baseline survey, report of alcohol use to physicians stratified by quality of physician question

	Did not report alcohol use to physician, Frequency (%)	Reported alcohol use to physician, Frequency (%)
Asked about alcohol in unclear and/or leading manner	18 (78)	5 (21)
Asked about alcohol in clear, non-leading manner	21(42)	29 (58)

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